

CLAIMS

1. Method for determining the speed of a transmission member in a hybrid powertrain, said powertrain including a hybrid transmission having at least one motor operatively coupled to said transmission member and at least one rotation sensor for operatively sensing rotation of said preselected
5 transmission member, comprising:

providing a first signal indicative of the speed of said transmission member calculated from the output from said at least one rotation sensor;

10 providing a second signal indicative of the speed of said transmission member calculated from the speed of said at least one motor and an effective rotation ratio between the transmission member and said at least one motor; and,

selecting as the speed of the transmission member said second signal when predetermined conditions indicate that the first signal is unreliable.

2. The method for determining the speed of a transmission member as claimed in claim 1 wherein the transmission member comprises an output member.

3. The method for determining the speed of a transmission member as claimed in claim 1 wherein the predetermined conditions which indicate that the first signal is unreliable include a) speed of the transmission member below a predetermined threshold, and b) loss of sensor output.

4. The method for determining the speed of a transmission member as claimed in claim 1 wherein the speed of said at least one motor is provided by a motor controller.

5. Method for determining the speed of a transmission member in a hybrid transmission including at least one electric motor, comprising:

- providing as the speed of the transmission member a first speed signal calculated from at least one output from a redundant pair of rotation sensors operatively sensing rotation of the output member when either speed sensor is providing an in-range output; and,
- 5 providing as the speed of the transmission member a second speed signal calculated from at least one motor speed and an effective rotation ratio between the preselected transmission member and said at least one motor
- 10 when neither speed sensor is providing an in-range output.

6. The method as claimed in claim 5 wherein said rotation sensors comprise variable reluctance sensors, further comprising:

providing as the speed of the transmission member the second speed signal when output member speed is below a low-speed threshold.

7. Method for determining the speed of a transmission member in a hybrid powertrain, said powertrain including a hybrid transmission having at least one motor operatively coupled to said transmission member and at least one rotation sensor for operatively sensing rotation of said transmission member, comprising:
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providing a first signal indicative of the speed of said transmission member calculated from the output from said at least one rotation sensor;

- providing a second signal indicative of the speed of said transmission member calculated from the speed of said at least one motor and
10 an effective gear ratio between the transmission member and said at least one motor;

selecting as the speed of the transmission member said first signal when a first set of conditions are met; and

- selecting as the speed of the transmission member said second
15 signal when a second set of conditions are met.

8. Apparatus for determining speed of a transmission member in a hybrid powertrain, said transmission including at least one motor operatively coupled to said transmission member, comprising:

- a sensor adapted to sense rotation of the transmission member and
- 5 provide an output signal therefrom;
- a motor controller adapted to provide a motor speed signal therefrom; and,
- a computer based transmission controller having a set of program instructions adapted to calculate a first speed signal from the sensor output
- 10 signal and a second speed signal from the motor speed signal and an effective rotation ratio between said at least one motor and the transmission member, and further adapted to select as the speed of the transmission member one of the first and second speed signals.